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OUTLOOK NOTES

THAT there is a science of education, either *in esse* or *in posse*, is now a part of the creed of most people. Some still do not believe that there is such a thing. In one distinct mark of a science it must be granted that education is still far from the dream of perfection, namely, in its technical nomenclature. The word "education" itself is used with several distinct meanings, which are by no means sharply delimited, and often lead to confusion. Three terms of common use are made to denote interchangeably each of three very different things, each of which really needs one good name that shall be peculiarly its own. These terms are "program," "curriculum," and "course of study." The hardest worked of the trio is "curriculum," which is made to do service in all three capacities. The need for the other expressions, "program," and "course of study," grows out of modern conditions. "Curriculum" is old and time honored. So long as all students studied the same thing this word sufficed for all uses, but with the increase in range of studies offered in schools and colleges it became necessary to express a new idea for which the old word was generally, but not accurately, used. With the large range of studies — far more than any one student can pursue — that is now offered in our secondary schools,

COURSE
PROGRAM
CURRICULUM

three distinct features need to be specifically named and accurately differentiated to denote (1) the whole range of studies offered by a particular school—the intellectual menu that it provides; (2) the particular meal selected for any student or class of students from this menu; (3) to specify the separate dishes which make up the menu and the meal.

The Committee on College Entrance Requirements very sensibly recommends that for the first we shall agree to use "program;" for the second the word "curriculum," and for the third the word "course." Which shall denote which is more a matter of agreement than of natural law. But agreement is certainly highly to be desired in order to put bounds to the confusion now prevailing in educational discussions through the careless and inaccurate use of these terms. In a small school the program and the curriculum might possibly correspond, though in very few schools is this at present actually the case. Rare is the secondary school that does not offer more studies than any one pupil can take in the prescribed length of time. The several courses of study furnish the units which make up both curriculum and program. At present the curriculum is a group of courses selected from the program and recommended to students having certain specific objects in view, generally preparation for some particular course in college or technical school. Indications are not lacking that the curriculum will become more and more an individual matter, selected and arranged according to the capacities and aims of the individual student. Just at present attention is directed and doubtless needs to be directed more to the "course" of study in the sense specified above than to the other two elements mentioned. Programs and curriculums have had their day, not that their day is past, but their relative importance is diminished. Emphasis is to be laid in the future upon the units. The virtue of a state rests upon the virtue of the individual citizens; so will the value of all curriculums and programs be determined by the thoroughness and appropriateness of the courses of study out of which they are built.

THE DESICCATING PROCESS

WHILE dried apples, dried corn, dried beef, and other dried things are still on the markets of the world, they by no means retain their former eminence as popular staples of diet. Even canned products, which aim to retain some of nature's juice and succulency, have been disagreeably affected in general esteem by modern history. The original article itself, fresh from nature, now holds first place in dietary councils. Here is a suggestion for those who undertake to furnish a diet for the mind. There must have been a widespread notion that what was intellectually interesting was in some way immoral, for text-books and outlines of courses of study have been to a large extent built upon the plan of making them as little attractive as possible. Difficulties to be overcome, attention to be subjected to the stern dominion of the will, have been factors too mighty in the dogma of formal discipline for any great sins against them to be tolerated. The dry-fact-bacillus has ravaged far and wide. Even books about education have not been able through their inherent interest to attract those who ought to read them in opposition to the deluding charms of poetry, history, and fiction. To introduce something of humane interest into text-books or outlines of courses, has been regarded as showing weakness, if not weak-mindedness. Few things can be conceived of more dry and forbidding than the average outline of a course of study in a secondary school. It is as formal and as schematic as possible. Only the barest enumeration of facts can generally be found there. This, of course, saves room, but it frightens readers. What is given is so little as to be unintelligible to all except the writers. Parents and children who have to use it find it about as helpful as so many pages of Babylonian hieroglyphics. The cost of printing some few pages is saved, but the end for which the course is published is missed altogether. Why should there not be an outline of courses given which should contain something of the scope, of the courses, the method of teaching, the material used, and, particularly, of the reasons for studying that particular subject, the educational aim to which it contributes? Why should such an outline not show in cases of history, literature, science, and the

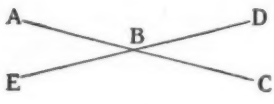
languages something of the charm and fascination which those subjects possess? Why picture the course of study as a dreary desert which one must pass to reach a desirable resting place upon the farther side? Why not at least show that in this desert there are oases with cool springs and springing flowers? Why not take twenty pages, if needed, to interest, and attract, and instruct, rather than five pages to puzzle, and dissuade, and disenchant? Why exclude the elements of humanity and literature altogether from the official descriptions of institutions maintained by the people for humanistic and literary culture?

C. H. THURBER

RELATED THEOREMS IN GEOMETRY.

A GREAT deal of confusion prevails among high-school pupils —and is sometimes indicated in text-books—as to the relations between certain important groups of theorems. The distinction between a restatement of an old theorem in new words and a fundamental change in that theorem, requiring new proofs, is seen hazily if at all. For these reasons the following comments on certain important related theorems in geometry may be of value to some other teacher, as their investigation has been to me.

1. Take the proposition, "If two straight lines cross, their vertical angles are equal;" and restate it in terms of the accompanying diagram as follows:



If { AC and ED are straight lines crossing at B

Then { $ABD = EBC$
{ $ABE = DBC$

Now state its converse, first in terms of the diagram,

If { $\sphericalangle ABD = \sphericalangle EBC$
{ $\sphericalangle ABE = \sphericalangle DBC$

Then { AC and ED are straight lines crossing at B.

If the attempt is now made to express this in general terms, one is compelled to examine the "If-clauses" in each case very carefully to find out what is essential in them, what is accidental, and what is concealed. It is evident that we have four angles with a common vertex B; also that ABD is adjacent to DBC, DBC to EBC, EBC to ABE, ABE to ABD again; in other words these four angles constitute the total angular magnitude about the point B. The hypothesis of the converse names these angles, in pairs, as equal to each other; how shall we describe them? Opposite is no longer an apt term, as it seems to beg

the question to a certain extent; let us call them non-adjacent. Now the conclusion. We might say "The common side of each pair of angles is in a line with the common side of the other pair."

In general terms, then, the converse of this familiar proposition may be stated as follows:

In the figure formed by four angles which occupy the entire angular magnitude about a point in a plane, if the non-adjacent angles are equal, the common side of each pair of adjacent angles is in a line with the common side of the other pair.

By introducing another convenient term for a line extending indefinitely in one direction only,—the ray,—the statement may be more neatly made, as follows:

In the figure formed by four rays from the same point in the same plane, if the non-adjacent angles are equal, the alternate rays are in a line.

In order to see that this is the converse of the original proposition, it is necessary to restate that; and then comparing its new form with the familiar form, it is necessary to see that they are differently worded statements of the same fact. Compare them:

If two straight lines cross each other, the vertical angles are equal

In the figure formed by four rays from the same point in the same plane,—if the alternate rays are in a line, the non-adjacent angles are equal.

Statements which express the same fact in different ways will be called in this article "congruent" statements.

The original form of this proposition, "If two straight lines cross, etc.," has the advantage of presenting the figure from the point of view in which it usually occurs. The recognition of congruent theorems, as in this case, is an important accomplishment for the student.

2. In the amended form, a certain part of the hypothesis is

common to the direct proposition and its converse. So that while the whole hypothesis is comprised in the words, "In the figure formed by four rays from the same point in the same plane, if the non-adjacent angles are equal—," one cannot construct the converse by inverting the hypothesis and conclusion, in accordance with the definition of "converse propositions."

The part of the hypothesis common to both propositions is called the "Universe of Discourse" for those two propositions. The "Universe" of things talked about is narrowed down, first to geometrical figures, then to plane figures, and finally, for these two propositions, to figures formed by four rays from one point.

Similarly, in the well-known propositions about supplementary adjacent angles, the universe of discourse is figures formed by pairs of adjacent angles; the converse propositions being:

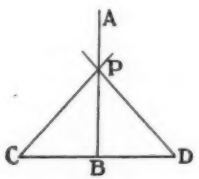
If the exterior sides are in a line
their sum is two right angles.

If their sum is two right angles
their exterior sides are in a line.

This separation of the hypothesis proper from the phrases which define the universe of discourse becomes of great importance in certain locus propositions referred to below.

3. Related propositions can be most accurately studied by separating them into definite statements, each containing, so far as possible, only a single fact or condition. Thus for the proposition

"If one line is perpendicular to another at its middle point, every point in the perpendicular is equally distant from the ends of the line,"—we may construct the following diagrammatic statement:



$AB \perp CD$
P is in AB
$CB = CD$
$PC = PD$

These four clauses may be put, in general terms, as follows:

[X] $AB \perp CD$	A perpendicular is drawn to a line.
[Y] P is in AB	A point lies in the perpendicular.
[Z] $CB = BD$	The perpendicular bisects the line.
[W] $PC = PD$	The point is equally distant from the ends of the line.

For convenience of reference, letter these four statements X, Y, Z and W, respectively.

If we take the first two clauses, X and Y, as universe of discourse for this proposition, the "converse" would be $XYW = Z$; that is, in general terms,—

If equal oblique lines are drawn from any point in the perpendicular to a line, they cut off equal distances from its foot.

Congruent with this are the theorems,—

A perpendicular from the vertex to the base of an isosceles triangle bisects the base.

A diameter perpendicular to a chord bisects it.

Congruent with the original theorem, $XYZ = W$, of which this is the converse, are:

If from any point in the perpendicular to a line, oblique lines are drawn cutting off equal distances from its foot, the oblique lines are equal.

The perpendicular to a chord at its middle point passes through the center of the circle.

Any point in the bisector of a line is equally distant from its ends.

Good teaching for these theorems would consist in showing their congruence with the theorem $XYZ = W$. If a pupil, in "proving" one of them, formally stated his hypothesis and conclusion in terms of a typical diagram, and then referred to $XYZ = W$ as his authority, he would show that he had not received such teaching. A pupil well-taught would reply to his examiner: "This theorem is congruent with [$XYZ = W$] which is proved as follows. . . . "

The pupil then should be trained in recognizing and devising congruent theorems—especially those which introduce compensating negatives, and those which condense by the use of technical terms.

For example, no student should be quit of the theorem $XYZ = W$ till he could recognize it in such forms as:

The bisector of a line contains no point unequally distant from its ends.

4. Most important, among the theorems congruent to a given one, is its "contranominal," or, in the phraseology of Wentworth, the opposite of its converse. The contranominal of any proposition is formed by denying its conclusion for a new hypothesis, and by denying its hypothesis for a new conclusion. The theorem so formed is always congruent with the given one.

Thus, granting the proposition,

If A is B, then C is D, is the same as saying that

If C is not D, then A is not B.

Congruence is more evident in the form, A is not B unless C is D.

It is sometimes easier to prove the contranominal of a proposition; such a proof is called the *reductio ad absurdum.*

It is sometimes more economical to prove the contranominal of a proposition; such a case is the converse, $XYW = Z$, of our original theorem. If we prove instead, that

Of oblique lines drawn, cutting off unequal distances from the foot of a perpendicular, the more remote is the greater,—

then we prove $XYW = Z$, and other facts in addition.

The opposite of a theorem is formed by denying the hypothesis for a new hypothesis, and denying the conclusion for a new conclusion. It is evident that the opposite of a theorem is congruent with its converse.

5. Returning now to the theorem $XYZ = W$, it is evident that we have three converses for it, according to which pair of clauses we take for universe of discourse. In the following diagrams the clauses belonging to the universe of discourse for any set of propositions are in black type.

INVERSES

X **Y Z** $= W$	W **Y Z** $= X$
X Y **Z** $= W$	**X** W **Z** $= Y$
X Y $Z = W$	**X Y** $W = Z$

For each of these four distinct propositions three different "opposites" may be written, *e. g.*:

$$XYZ = W$$
$$x\,\mathbf{Y}\,\mathbf{Z} = w^1$$
$$\mathbf{X}\,y\,\mathbf{Z} = w$$
$$\mathbf{X}\,\mathbf{Y}\,z = w$$

The operation of deriving the opposite from any theorem will be called "obversion;" that of deriving the converse, "inversion."

The entire group of propositions derived by simple inversion and obversion from $XYZ = W$ is as follows:

I. $XYZ = W$
II. $XYW = Z$
III. $XWZ = Y$
IV. $WYZ = X$
V. $XYz = w$
VI. $XyZ = w$
VII. $xYZ = w$
VIII. $XYw = z$
IX. $XyW = z$
X. $xYW = z$
XI. $XWz = y$
XII. $XwZ = y$
XIII. $xWZ = y$
XIV. $WYz = x$
XV. $WyZ = x$
XVI. $wYZ = x$

Of these (VIII) is contranominal to (I) with XY for universe of discourse; (XII) is contranominal to (I) with XZ for universe of discourse; (XVI) is contranominal to (I) with YZ for universe of discourse.

Similarly (II) has for contranominals (V) (XI) (XIV)
" (III) " " (VI) (IX) (XV)
" (IV) " " (VII) (X) (XIII)

So that it is only necessary to prove (I) (II) (III) (IV); the other twelve can be cited in scholia.

On further examination it is evident that in each of the four groups

(I) (VIII) (XII) (XVI); (II) (V) (XI) (XIV);
(III) (VI) (IX) (XV); (IV) (VII) (X) (XIII);

each proposition is contranominal to each of the other three; so that to establish the whole sixteen, it is only necessary to prove one in each group.

[1] In these diagrams the negative of any clause is indicated by writing its representative symbol with a small letter.

It will be found that nearly all elementary text-books of geometry give formal "demonstrations" of (I), (II), (V) and (VI) and also of the three congruent forms of (I) given above, without any comment whatever on the cogency of a proof which quotes its demonstrandum for authority.

The proposition (IV) ($WYZ=X$) may be thus stated:

"The medial of an isosceles triangle is perpendicular to the base." Or,

"The diameter through the middle of a chord is perpendicular to it."

Neither of these propositions is commonly demonstrated.

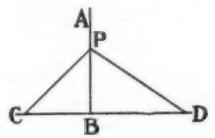
6. Certain facts remain to be emphasized in connection with the theorems of this set that contain negatives.

In discussing the theorem,—

"If from a point in a perpendicular to a line (oblique lines are drawn to the line) XY, the oblique lines that cut off the greater distances are greater than the oblique lines that cut off less"—

$$\underline{z} \text{ or } \bar{z}$$
$$\underline{w} \text{ or } \bar{w}$$

We may represent the different clauses by letters corresponding to the following diagram:



$AB \perp CD$	X	$\bar{z}$ means $BD<BC$
P is in AB	Y	$\bar{w}$ " $PD<PC$
$BD>CB$	$\underline{z}$	
$PD>PC$	$\underline{w}$	

Geometrical diagrams are types of the class of geometrical figures whose class marks are given by the hypothesis of the proposition which they illustrate. Such classes may be called homogeneous classes, and defined logically by the fact that when any proposition is affirmed of any particular set of members of the class, any other set of members may be substituted . . . that is, any particular set serves as a general representative set.

It often happens that any geometrical figure of a certain type is intimately associated with a particular geometrical figure of another type; *e. g.*, circles and their centers, tangents and their

points of tangency, oblique lines from a point in a perpendicular and the "distances cut off" by them. . . .

Here it is convenient to define conjugate classes as those containing the same number of members, and having each member of one corresponding to a particular member of the other.

Now we can state a theorem which will be useful in discussing the proposition $XY\underline{z}=\underline{w}$:

Theorem. If, as hypothesis, any relation is affirmed among members of a homogeneous class, and, as conclusion, a relation is established among the corresponding members of a conjugate class, then the terms of the hypothesis may be transposed in any order, and the corresponding relation in the conjugate class is a valid inference.

The condition $\underline{z}$ $(BD>CB)$ does not logically differ from $\overline{z}$ $(CB>BD)$ because the geometrical figures CB and BD are each typical diagrams, members of a homogeneous class; similarly for $\underline{w}$ and $\overline{w}$, considered by itself. But PD and BD are corresponding types of conjugate classes—so are PC and CB—and therefore the combined statements $\underline{z}=\underline{w}$ imply $\overline{z}=\overline{w}$, without implying $\overline{z}=\underline{w}$ or $\underline{z}=\overline{w}$. That is the new fact which is established by the proof of this after $XYW=Z$ has been proven.

It is more economical to prove this proposition, and from it infer proposition $XYW=Z$. Thus for establishing the whole series of sixteen propositions we prove the following four:

If from a point in a perpendicular to a line two oblique lines are drawn to the line, cutting off unequal distances from the foot of the perpendicular, the one that cuts off the greater distance is the greater; and conversely, if two unequal oblique lines are drawn, the greater of them cuts off a greater distance (from the foot of the perpendicular) than the other does.

V	VIII
$XY\underline{z}=\underline{w}$	$XY\underline{w}=\underline{z}$

If a perpendicular is erected at the middle of a straight line, any point not in the perpendicular is unequally distant from the extremities of the line.

VI

$XyZ=w$

The medial of an isosceles triangle is perpendicular to the base.

IV

$XWZ=Y$

There is in fact a much larger series of propositions connected with $XYWZ$. These are sometimes stated in some such form as this :

X $AB \perp CD$
Y P in AB
Z $CB=BD$
W $PC=PD$
U $BCP=BDP$
V $BPC=BPD$

If any three of these propositions are true, all are true.

In order to establish this comprehensive statement it is necessary to prove 18 propositions, namely : four each for the 16-set $XYZ=W$, the 16-set $XYZ=U$, and the 16-set $XYZ=V$; also six for propositions containing U and V together in the hypothesis.

If two of the six statements $XYZWUV$ were affirmed, and another denied, the other three would be denied implicitly ; for not one of them could be true without making three propositions true out of the series, and thus establishing all.

Thus if two of the statements were true the other four must be either all true or all false.

If one statement is true and another false, one of the remaining four, and one only, may be true ; and then the rest must be false ; or else all the remaining four must be false.

If one statement is true, all the others may be false, or all false but one, or all true.

If there are, in general, $\underline{n}$ statements, such that the affirmation of any $\underline{k}$ of them implies the affirmation of all the rest, then—

In order to infer the denial of any particular one of these statements it is necessary to affirm $k-1$ and deny one ; then all the rest would be denied implicitly.

[For if another one should be true, $\underline{k}$ statements would be affirmed, which would imply all the rest.]

In order to a valid inference, $\underline{k}$ statements must each be either affirmed or denied.

If one statement is false, not more than $k-1$ can be true.

If $n-k$ statements are denied at least one other is; if j statements are denied, $n-k+1-j$ others are.

The total number of statements denied must be either $=0$ or $> n-k$.

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THE ARTICULATION OF SCHOOL AND COLLEGE WORK IN THE SCIENCES[1]

III

FOUR PLANS FOR THE ARTICULATION OF SCHOOL AND COLLEGE SCIENCE

The natural method, distinctly indicated by the above considerations, would be that of providing a special college course, in continuation of each study, for the benefit of the entrants in each science. The aim of this course would be to complete the preparation of the student in the general field of the science. It would leave him with knowledge of this equivalent to that acquired by those who begin the study in college and take the regular college one-year course, and sufficient to enable him to pursue an advanced topic. Not till this point was reached would union of the two groups of students take place. It is certainly not necessary that the junction of the two bodies of students should take place immediately on admission to college work in each subject. The considerations urged above, indeed, seem to show that this would be inexpedient, if not impossible. In spite of this, however, three ways of forcing the conventional method of articulation into the sciences have been tried. In each case either the college or the school course has been deranged in pursuit of the fetish of direct articulation with an established college course. These may be considered briefly before the more rational method is discussed.

1. The college one-year course is severed at the center and a year is given to the school in which to cover the ground of the first half of the subject. A continuous course of instruction can then be obtained by entering the second half of the college course either from the school course or from the first half of the

[1] Expanded from a report presented to the N. E. A. in July 1898 (Report for 1898, p. 954), and a paper read before a joint meeting of the high school and college section of the Illinois Teachers' Association in December 1898.

college course. The advantage is a direct articulation with a regular college course. The objection lies in an unfair circumscription of the school work by confining it to non-metals in chemistry or to mechanics and sound (say) in physics, and reserving the remainder of each field for the college. Here the school pupil who never proceeds to college suffers a real deprivation in order that a minority of his comrades may secure the imaginary advantage of an articulation of their work on lines used in mathematics (where elementary algebra, plane and perhaps solid geometry are relegated to the school, and other topics are reserved for the college). It is a slavish adoption of the plan for subdivision used in another subject, without the justification which there exists. This plan is used in one of the three institutions already mentioned as being the only ones which attempt systematic articulation in chemistry.

2. The second plan is the converse of the first. The college gives no introductory instruction in a science beyond a course of high-school caliber, so that this or a school course secures equal privileges in entrance to advanced courses in college. Closer inquiry reveals the fact, however, that the entrants, although they all receive credit in a science, are unequal and have to be sifted. Some are advanced and others are placed with the beginners. In fact none of the institutions which might be classed here apply the same principle to all the sciences or to all the entrants in any one science. They have uniformity neither in system nor standard either in admission or college work. They fall into this group rather because they do not belong to any of the others than because they adhere to any plan that can be defined.

The first plan mangled the natural school course so as to make it of like content with the first half of the college course for the purpose of articulation. The second emasculates the college work so as to reduce it to equivalence to the school course for the same purpose. It seems to be strangely fatuous to strive after a mechanical adjustment by invading the rights of the average school pupil or throwing away the natural advantage of the college. If the college cannot give introductory

courses in the sciences, heavier on an average than corresponding school courses, it has no right to exist. A course which is excellent in a school would be, in some respects, mediocre in a college.

It must be confessed that, in some colleges, the mediocre introductory course is a matter of choice independently of any convenience for articulation which it may bring. But the tendency seems to be in the direction of higher standards in college work in science, so this particular case may be dismissed as a passing phase.

3. The third plan, like the second, provides a college course equivalent to the admission requirement, but, aiming at greater thoroughness in preparation for advanced work, it puts another year of college work covering the same ground on the top of each! This seems to err as far on the side of thoroughness as the former did on that of superficiality.

Under this system the students who began the subject in college, and they probably form the majority, suffer unnecessary loss of time. They pursue the same topics twice, often under the same instructor, in the same laboratory. For them it involves two harvests for one crop and much superfluous palinology. The first plan sacrificed all the school pupils who did not go afterwards to a particular university. The third secures articulation by sacrificing the interests of the college students who did not offer the subject for admission. Both methods accommodate a few at the expense of the large majority.

This plan is that of the department of chemistry of another of the three institutions mentioned. The loss of time is here enormous, as each of the two college courses, constituting together an introduction to the facts and principles of the science, is spread over a whole year. The curious feature of the situation is that many of the beginners are advised to enter the second college course without having taken either the school or preliminary college course! This institution seems deliberately to slight, not only the school work, but its own introductory course as well. It provides a clumsy method of articulation and then makes mockery of the advanced character of the course,

to which a pupil gains admission by a hard year's work in a school, by swamping it with beginners. The method appears therefore to be unworkable in practice.

4. The first plan secures an allotment for the school course by bisecting the college course. The third reaches the same end by doubling the college course. Considered together they form a very pretty paradox. The fourth plan, as we have hinted, simply provides a supplement to the school course to supply the missing link between the admission unit and the second year of college work. The one-year college course is independent of this. The natural school course and the natural college course both remain unmutilated. All that is necessary is to secure a homogeneous group of students for the special class in which the school work is supplemented. For this purpose the extent and kind of work to be offered for admission must be definitely outlined on the basis of what the schools can do, and must be rigidly exacted when credit is given. The advancement then takes care of itself. The length, content, and standard of this special course will be adjusted so as to bring the school knowledge of each subject up to the measure of the college unit. If the admission standard has to be set low, or the college course is unusually heavy, the supplement will be long, and *vice versa*. It will leave the students ready to pursue advanced work in the same classes with those who have completed the college introductory course.

This plan would seem to provide for the most complete recognition of the preparatory work, and for granting the full advancement the pupils have earned, since the special course can be adjusted exactly to the equipment the entrants bring with them.

It involves two distinct non-consecutive courses, and, therefore, additional instruction. This practical difficulty is not so great as it seems, since the individual nature of laboratory work makes it easy to give a different set of exercises to the advanced section without greatly increasing the burden on the instructor. Separate quizzes are absolutely necessary. It is advantageous for many reasons to require the advanced section to hear part of

the course of experimental lectures given to the college beginners.

This plan is used by the department of chemistry of the University of Chicago, the third of the three institutions already mentioned as having definite plans for chemistry at all. Experience with the method shows that the diversity in preparation of entrants in chemistry, the average length of the interval since they last pursued the subject, and other circumstances are such at present that nine tenths of the members of the special class require about twenty-four weeks of college work to bring them to the level of college beginners who have worked nine hours a week for a year. There is no reason, however, why this proportion should not soon become much smaller. It is mainly a question of securing greater uniformity and thoroughness in their preparation. In every case, however, the adjustment is automatic, and the advancement is measured by the real attainments of the class as shown by the abbreviation they effect in the time taken to reach the predetermined standard.

The statement so often made by college instructors, that a preparatory course is a positive harm to their pupils, is completely refuted by the results under this system. The advanced section progresses very rapidly, after its members have found their bearings, and at the end of twelve weeks, instead of being indistinguishable from the beginners, is in every way enormously ahead of them.

TWO CRITICISMS OF THE CHICAGO METHOD OF ARTICULATION

A new and unfamiliar plan for articulating school and college work can scarcely be expected to pass without criticism and some misunderstandings, and possible objections based thereon may be anticipated.

An objection which may be looked for is that to require students to take a college course covering the same field as that already traversed in school, even if the plane is higher, has the appearance of requiring repetition of the same work, instead of advance beyond it.

This objection is never raised against the ordinary policy of all institutions in respect to Latin, German, English, or history, yet the condition is obviously the same. The study of Cicero, Livy, or Horace may be pursued with different text-books from that of Caesar or Virgil, but the linguistic matter is largely identical in all. The college instructor knows the content of the antecedent school courses, and demands a distinct advance on this to the proper amount. To pass from Carhart and Chute's to Daniell's "Physics," or from Remsen's "Briefer course" in school to Remsen's "Advanced course" in college, is as real an advance as any in other departments.

There is a feeling that the sciences are different from the languages and history, and that the college course should be "an advance in a straight line from the end of the school course," and so the college course must be *called* chemical analysis, or physiology, or bacteriology, or mathematical physics, otherwise just advancement has been denied. The advance from a small book to a large book on general chemistry or physics is not an advance in a straight line, of course. But, if this be an objection, it is one which lies against the nature of the science rather than in the policy of a university. To secure an advance of this kind in chemistry, it would be necessary to discover some new elements, particularly new common elements, and reserve them for college use. The sciences are defective in respect to their fitness for being divided in this ideal (?) way just as much as, and no more than, other subjects. Yet no one demands a new language as the sole fit sequel to a year of school German or French. No one claims that a school course in mediæval history is repeated when the same title occurs among advanced courses in a college catalogue. It is not prophecy which is the natural sequel to school modern history, but modern history again with different books, a different instructor, a different attitude, a class selected by more rigid tests, and a call for closer discrimination, more minute study, and a broader view of the same thing. In mathematics alone does the number of semi-independent branches, into which the subject has been split, seem to set an example of a set of more

or less consecutive, yet distinct, topics. But this is no ground for forcing other subjects into subdivision on the mathematical model whether they are capable of subdivision or not. Continuing the same subject under a competent instructor is not ordinarily spoken of as repetition, and the expression is as inapplicable to chemistry or biology as to most other subjects.

In reality the important rôle which the laboratory plays in the teaching of science and the individual nature which may easily be given to this work, enables the instructor in a science absolutely to exclude the repetition of the same or similar experiments. In addition to special selection for any given class as a whole, there will naturally be supplementary accommodation to each person in the class. So that even the appearance of repetition is far more perfectly provided against in the sciences than is possible in most other subjects.

If the best course for the majority of school pupils is one which covers the whole field of each science, and there can be little doubt of this, and if the college course in the same subject is profounder in spirit and more complete in scope, then the plain duty laid on the college instructor of the pupils from the schools is that of more intensive cultivation of the same field with a view to preparing the entrants in each science for work in more advanced topics. In the broadest point of view, this course, far from involving unnecessary loss of time to the pupil from the school, is that which the nature of scientific work explicitly dictates.

Teaching necessarily involves presentation of the parts of a subject consecutively. This method leads to the mastery of plane geometry step by step. Knowledge of a science, however, consists in seeing every part in its relation to other parts and the mastery of a science involves therefore repeated study of the same topics. Thus, in chemistry, the elementary school course is followed by a college course, that by chemistry from the analytical point of view, and that again by theoretical and physical chemistry. The subject-matter is largely selected from the same general field in each of these cases. They are the same principles that are developed more fully at each stage and are applied and reapplied

throughout the whole series of courses. The standard, the point of view, the precision in manipulation, and the critical attitude are the varying elements. The sciences resemble the languages more than mathematics in this respect.

Another objection lies in the problem of providing suitable lectures for the advanced section. There are two possible plans.

1. The advanced section may be required to hear a part of the experimental lectures given to the beginners. This gives them the benefit of a systematic review of the principles and fundamental facts which they have studied before, in addition to much advance on the elementary school course. The whole will be valuable, as the schools cannot possibly attempt to imitate, much less to duplicate, a fully illustrated college course of lectures. The expense to the school and the tax on the time of the instructor would be too great. This is in accord with the universal practice in all institutions. The same experimental lectures are invariably given to all classes of students whether their work is in the college proper, the graduate school or the professional schools of medicine, pharmacy or engineering.

2. To save appearances, a separate series of unillustrated lectures, with attempt at more exclusive adjustment to the wants of the advanced section, may be given. To give this the character of a special set of elaborate experimental lectures would be out of the question on account of the expense in the matter of material and assistance. The money which this would cost would usually be expended to better advantage for these very students in any one of several other ways. It seems to me that, while neither plan is ideal, the former has, on the whole, distinct advantages over the latter.

RESULTS UNDER THE CHICAGO METHOD OF ARTICULATION

This method may be expected: (1) To encourage the study of optional sciences in schools, and their presentation as admission subjects; (2) to encourage the entrants in each science to continue the study of the same science in college; and (3), since

interest usually increases with advancement into a science, to tend to carry larger numbers of undergraduates into the more advanced courses.

The actual results in an institution where this method has been tried by the department of chemistry for three years may be of interest in this connection. The percentages of entrants offering chemistry as an admission subject, have been 35, 37, and 41, respectively. The number having entrance credit in chemistry who have taken further work in the same department is found to have increased fivefold when the last two years are compared with the three previous ones. The best students in advanced work have been found among those who have entered the department by this route.

To sum up, correlation of school and college science is possible and is well worth an effort to bring it about. The needs are — uniformity in school work, uniformity and definiteness in college entrance requirements, and provision for a definite and just advancement corresponding to the value of the admission credit. For the last, establishing a separate class, and giving it a special course, is the plan which, after trial of the others, is found to give the best results.

These three principles involve nothing new. They simply claim for science the same treatment that languages and mathematics now enjoy. If they are put into practice no college professor will ever regret that some of his pupils pursued his subject in school before they reached his hands. The obvious benefit of a good preparatory course will be placed beyond doubt by the results.

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THE SENTIMENTAL IN AMERICAN HISTORY

THE recent experience of the American people in carrying on a war for sentiment but to find themselves at the end confronted by new and perplexing conditions certainly warrants an examination of the justification of the sentimental as an influence in national policy.

"Sentiment rules the world" is a common saying; but it plays a small part in the commercial world. "Business is business" expresses the impossibility of conducting affairs on lines of sentiment. Whether wisely or not, sentiment also has little weight in determining the higher affiliations of life. Church membership, political complexion, the choice of a college, or the selection of a place of residence is likely to turn on family influence or some material consideration rather than sentiment. In fact some investigators are convinced that fewer unhappy marriages would follow a realization by candidates of the practical side of such relations rather than the sentimental view.

The basic law of society — the survival of the fittest — ignores sentiment. Under that law, society imprisons and exiles contaminating criminals, confines dangerous lunatics, excludes paupers from America, and suspends incorrigible pupils from the schools. Perhaps society may yet restrain the propagation of the vicious. We judge man as an individual according to his environment, his actions, and his possibilities; but in dealing with men in classes, sentiment replaces judgment, impossibilities are expected, and we complain because the days of miracles are past.

People well knew during slavery days that the slave-owner in order to protect his property was obliged to keep the mass of the slaves ignorant; yet no sooner was the negro a free man than we fondly imagined by placing a ballot in his hand he would become an intelligent citizen, capable of performing the highest function within the imagination of the student of political science.

In some miraculous manner, the slow process of evolution was to be overcome by an amendment to the federal constitution.

Having gained nothing by this experience, sentiment again painted the Cuban as a high-class gentleman who needed but a change of administration to make him capable of self-government. Useless to point out that we, the heirs of the ages and the highest type produced by evolution in many centuries, are but fairly succeeding in self-government; futile to show that the Cuban had never had opportunity for self-help. The letters of the American soldiers in Cuban camps first showed the American people as a whole what the newspapers, intent on fostering sentiment, had carefully concealed. Centuries of government for revenue only had not created a high respect for the rights of property in the Cuban mind.

These instances demonstrate the obligation on the framers of American thought—the writer and the teacher of American history—to correct constantly such sentimental refraction and set forth men and measures in their true light. Now that we have proven the attainment of our majority on the field of battle we may surely dare to admit that all Americans are not demi-gods and all American measures Providence-inspired. Sensitiveness should disappear with the boasting of youth. No longer should that writer who dares to point out a mistake in the nation's career fore-doom his work to eternal punishment; no longer should the teacher who replaces sentimental motives by reasonable grievances in studying the choosing-point of a statesman commit professional suicide.

In putting aside the sentimental from the study of a man's career, one should carefully distinguish between self-interest and selfishness. Either may influence a statesman in making a choice of position. But self-interest is a primary law of nature, generous, dependable, praiseworthy; selfishness is unnatural, narrow, and wholly unreliable. Self-interest seeks advancement; selfishness does not scruple to use others for such purpose. Selfishness usually poses as disinterestedness. The disinterested patriot in any cause is likely to be a hypocrite or an agitator who will soon disappear at a tangent through pure centrifugal force. You can

always count upon the man who enters a cause from a grievance. He has been moved personally. Why should we then find it necessary to conceal his grievance in a halo of "disinterested patriotism?"

It detracts not the least from the services of George Washington in the American cause to admit that he chafed under the British administration of the colonies. The military career upon which he entered with such good training and such high hopes brought to him a train of snubs and mortifications simply because he held a colonial instead of a king's commission. His western land was kept closed to the Palatinates because of the tithes of an established church. Under intercolonial jealousy and lack of coöperation, he saw the frontier unprotected and could give the distressed people no "further relief than uncertain promises." If he tried to punish a mutiny at Cumberland, the verdict was set aside because the fort was located outside Virginia. In casting his fame and fortune with the rebels Washington alienated himself from many of his friends, endangered his hard-earned military record, and, although a man of property, associated himself with the enemies of the existing government. It is simply reasonable to search for his motives in his grievances rather than in an empty sentiment.

The separation from the mother country bore even more heavily on Franklin than it did on Washington. Why did he choose the patriot side? An Englishman by taste and habit although born in the colonies, he always spoke of a journey to England as "going home." A residence of over ten years still further endeared England to him. But this sentiment was rapidly overcome in his unwarranted dismissal from his position as deputy postmaster-general for America and by the insults of of Wedderburn. It was natural for him to hope for restoration to favor. It need not diminish our respect for him because he was kept dangling two years in England by suggestions of another appointment — possibly the governorship of Pennsylvania. If continued disappointment and ill-treatment turned Benjamin Franklin to the American side, the historian and the teacher do no violence to his patriotism in saying so.

American writers have tried constantly to refute the charge that James Otis turned anti-administration because his father failed to obtain a judgeship, and that Patrick Henry's words convict him of seeing a greater career as an agitator than a friend of government. We are irritated by the suggestion that Samuel Adams had a moving grievance in the paper-money difficulty which he had inherited from his father, and that John Hancock was lukewarm in the cause until the sloop "Liberty" was seized. We do not wish to have pointed out the letters of John Adams to his wife showing the careful thought he gave to the choosing of sides and the fact that he never committed himself by taking active part in a patriot meeting until eight years after the passage of the stamp act. If the Revolutionary leaders were men who chose their ground carefully and after mature deliberation and because of a personal experience and for a reasonable motive, American sensitiveness should not be unwilling to admit it. In fidelity only can we secure the prime fruits of the study of history—the imitation of the best parts and avoidance of the worst parts of men and measures.

Sentiment demands perfection. It would endow the Constitution-makers with more than human wisdom and ascribe to prescience what was probably due to an accident—"We, the people of the United States." In the protracted slavery struggle, sentiment forbids either side admitting a modicum of wrong or a shadow of inconsistency; and the teacher of North or South who tries to show that the ensuing war was a great mistake which might have been avoided if both sides had not been blinded by passion does so at his peril. How can we claim a united people so long as different text-books on American history are needed for different parts of the land? Sentiment and passion still rule.

Sentiment would carefully avoid reference to Abraham Lincoln overcharging his mileage when a member of Congress as he and others did. It would apologize for him because he wrote letters soliciting votes when he was a candidate for office. It would try in some manner to explain why he contributed to campaign funds as the modern "politician" does. Indeed, there will be found those to insist that the teacher picture Lincoln as

a mighty champion of anti-slavery, fore-ordained and fore-determined to strike the shackles from the slave; as a giant who blew defiant blasts toward the South, refusing to listen to compromise or entreaty. To such sentimentalists the conciliatory message sent by Lincoln to Stephens after his election that "the South will be in no more danger in this respect (slavery) than it was during Washington's administration" fails entirely to show that he was a man of the people, waiting to see what they wanted done and very anxious not to get too far in advance of them.

True historical spirit, the earnest desire to know the exact truth, would demand that we study and paint men as they actually are. "Wart and all" may not make a beautiful portrait, but it is at least honest and trustworthy. Indications are not wanting that the mirage is passing and that the outlook is appearing in truer and broader relations. We are growing more tolerant of the reforms of other nations, more willing to admit that we have points which may be improved. When schoolbook-makers announce a history prepared especially for a section of the United States and to be "submitted for approval," a storm of protest causes the wary mariners to trim sail immediately. When a war conducted on ground of a sentiment is ended, the great American people pause to take reckoning before gathering unto themselves the accustomed fruits of victory.

With such hopeful indications, it may be that rational grounds will gradually supplant the fanciful in national thought and action. With the assistance given by the reasonable writing and teaching of American history we may free ourselves from the charge made by Wendell Phillips that we "read history with our prejudices and not with our eyes."

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RESULTS IN THE PRUSSIAN GYMNASIUM

It may be said at the outset that nowhere else in the world are the general conditions more favorable to good schools than in Germany. In no other country is a sound education more necessary for the maintenance of the integrity of the nation and the autonomy of the race. The instinct of national preservation acts as a powerful incentive towards such a system of instruction and discipline as shall result in seriousness of mind and a readiness to submit to rigid laws. If we were surrounded on either side by powerful and aggressive enemies, and if our national existence depended upon our having a large number of highly educated and well trained men, it would be less difficult to impress our people with the importance of a vigorous and scientific training. As it is, there are not a few of the patrons of our secondary schools who not only do not believe in the necessity of subjecting boys to systematic and thorough discipline, but decidedly object to it when their own children are concerned.

In any attempt to estimate the value of the training of the gymnasium, or to find out how the secondary schools of Prussia obtain their results, the first thing to be reckoned with is their peculiar system of school government. It is effective and complete to the last degree. The order is so perfect, and the attention of the pupils to the work in hand is so absorbing and persistent that the superficial observer cannot fail to be impressed with admiration for the system and pity for the boys. The sources of such a severe form of school government must be sought for, I believe, outside of the school. The presence of a large standing army, the belief that there is urgent need of maintaining it at the highest point of efficiency, and the strict enforcement of a rigid code of civil and criminal law have more to do with fixing the standard of discipline in the schools than the schools themselves. No American teacher would wish to see such an artificial and arbitrary standard of school government established here. It is neither possible nor desirable.

The purposes of school government in the two countries are widely different. Prussian children are trained to submit to authority, but our boys must be taught to govern themselves. The former are to be the subjects of a despot, the latter are to participate in the government of a free state. This difference in the purposes of school government involves a corresponding unlikeness in methods of discipline. In the one country the control of the school is direct, absolute and sometimes severe; in the other the teacher constantly appeals to the reason of both pupils and parents and exercises strict authority under the law only as a last resort. To bring a school under effective control by methods that command the assent of reasonable and liberty-loving pupils is just as difficult and quite as essential as to give skillful instruction in the several subjects of study. Our boys, as we believe, must have a definite degree of freedom of action, the larger the better so long as the proper work of the school is not interfered with. But to determine just where the liberty of the pupil shall end and the restraint of the school begin is a question so complex and delicate that it often taxes to the utmost the wisdom and resources of the teacher. The Prussian schoolmaster is not called upon to solve any such perplexing problem. The time, thought and energy which we expend in school management, he may devote to strengthening his scholarship and increasing the efficiency of his instruction.

But in respect to effectiveness of organization the superiority of the Prussian gymnasium is very great. I use the word organization to include the curriculum of studies, the character and methods of the instruction, and the training, appointment and pensioning of teachers. In formulating and executing wise plans of education an autocratic government has immense advantages. The wisest men may be called upon for counsel, and the ablest men of the empire may be entrusted with the responsibility of administering the affairs of the schools. In Germany a great school reform may be inaugurated in a day; in America reforms come only after long periods of discussion and agitation.

In Prussia there is a splendidly elaborated system of state schools; in America there is a kind of local option in education.

The general looseness and weakness of our organization seem to be a part of the price that we have to pay for our free institutions. The right of our municipalities to organize and direct their own schools is as carefully guarded and persistently maintained as if the perpetuity of the civil liberties of the people were dependent upon it. The slowness of the decadence of the old New England district school system is a striking illustration of the stubbornness with which our people resist all tendencies towards centralization in government. Under our present municipal form of organization we cannot expect to have such a uniformly good system of schools as we find in Prussia.

Another source of weakness in our education becomes apparent when we begin to examine our courses of study. They are more varied in their form and content than the climate and productions of the localities which they represent. They lack coherence, rational order, and stability. They are subject to the caprice of school superintendents, principals, teachers and influential members of school boards, who may, or may not, be well informed in the philosophy of education. In Prussia, however, programs of studies are carefully matured by wise and learned men after a protracted and profound study of the ends and means of education. Our lecturers on education talk in a wise way about the correlation of studies, but in Prussia we may see the principles of correlation in actual operation in the courses of study and methods of instruction. This is especially true in the gymnasium where we find a definite and elaborate scheme of studies and a careful attention to the details of instruction. I cannot attempt within the limitations of this paper to give a formal analysis of the curriculum of the gymnasium. And yet, it is easy to find embodied in it several of the most important principles formulated by the Committee of Ten. I quote from page 16 of their report. "It is inevitable, therefore, that specialists in any one of the subjects which are pursued in the high schools or colleges should earnestly desire that the minds of young children be stored with some of the elementary facts and principles of their subjects; and that all the mental habits which the adult student will surely need, begin to be formed in the

child's mind before the age of fourteen." The acceptance of this most important general truth would revolutionize our elementary education. Prussia has already accepted it and demonstrated its practicability and utility. The boy of fourteen in the gymnasium has had something more than the husks of learning. He has had five years of Latin, two years of Greek, five years of history with the related geography, five years in the elements of arithmetic, algebra and geometry, four years of natural history with one of physics, and a continuous course of five years in German, religion, writing, drawing, singing, and gymnastics. A comparison of these subjects of study with those that are set before a boy from nine to fourteen years of age in an average American grammar school, will show very clearly one of the means by which the Prussian gymnasium achieves such large results. The pupil's vigor of application, range of thought and grasp of subject-matter during these golden years of a boy's education are much greater with them than with us. Their program of studies is much more extensive and intensive than ours, and, although the gymnasium is a clearly defined classical institution, only about 35 per cent. of its time is spent upon Latin and Greek. It is worthy of note too that there are no short courses in any subject of study. German, Latin, history, mathematics, science, religion, singing and gymnastics are pursued continuously for nine years; while French and Greek are studied respectively seven and six years.

I have already alluded to the great superiority of the organization of the Prussian schools. To my mind the most striking and important characteristic of this organization is the large number of class exercises. The average number per week for the nine years of the curriculum of the gymnasium is thirty-three. This includes singing, drawing, and gymnastics, but excludes English and Hebrew, which are electives. It is well-nigh impossible to exaggerate the far-reaching significance of this fact, when we attempt to compare the achievements in scholarship of the Prussian gymnasium with the results attained in the secondary schools of the United States. Twenty lessons a week nearly represent the maximum in our best schools,

What would be the outcome if we could enlarge this number by 50 or 60 per cent.? The curriculum could be enriched, more subjects of study could be pursued continuously, and the effectiveness of the instruction could be increased. Consider the amount of energy that our pupils expend in misdirected and futile efforts. Compute the time that is wasted before they acquire the habits of study, or the power of persistent application, by means of which the student grapples successfully with subjects that are hard to understand. In the gymnasium this loss and waste are minimized. For instance, perplexing problems in mathematics are solved under the eye and guidance of the teacher. The paradigms of Latin and Greek are clearly taught in the class room; they are not memorized as disconnected facts, but practice in the use of words in their right relations goes on *pari passu* with a study of their forms. This stimulating help of the teacher insures rapid progress, and runs clear of the errors and misconceptions that pupils make, who spend only enough time with the teacher to recite the lessons that they have learned elsewhere. It must be, too, that no inconsiderable number of our pupils fail in scholarship for the lack of just such skillful and systematic instruction as the Prussian teachers give, and which we cannot impart for want of time. Those who survive the struggle in our schools are doubtless more self reliant than the students of the gymnasium, but, since only about two thirds as much time is given to their instruction, they cannot fairly be expected to attain the same standard of scholarship.

In listening to recitations in foreign languages, I was forcibly impressed again and again with the fact that the instruction of the gymnasium appeals to the sense of hearing more than to the sense of sight. In our own schools it is quite common to see translations from English into foreign languages written by pupils on blackboards and corrected in the presence of the class. An exercise of this kind in the gymnasium did not once come under my observation. An equal amount of work was often done orally in less than half the time. But written lessons were not wholly neglected. Test exercises written in blank books

and subsequently corrected by the teacher were sufficiently frequent to acquaint the instructor with the progress of each pupil and the accuracy of his knowledge of vocabulary, forms and syntax. The rapidity of these oral exercises was quite wonderful, and surpassed anything of the kind that I have ever seen in the schools of this country. This unusual facility in oral recitations is of course a natural consequent of a greater fullness and readiness of the memory. In the younger classes the demands made upon this faculty are severe and continuous. The Germans seem to recognize more clearly than we do, that the years preceding adolescence are best adapted to the acquisition of knowledge through the memory.

A writer in a recent number of the SCHOOL REVIEW declared that the aims of classical study in Germany have undergone radical modifications in recent years. My observations agree with this declaration. The official statement of the general aim of the study of Latin in Prussia is expressed in these words: "The understanding of the more important classical authors and philological training." It was clearly evident in the instruction that the order of importance of the two general aims mentioned agrees with their order of precedence. In the more advanced classes the examination and discussion of the content of the classic authors occupied a large share of the time of the recitation. Questions concerning the modes of warfare, the institutions of government, and the forms and essence of the morality, religion and philosophy of the ancient Greeks and Romans constantly recurred. In one recitation where a group of boys eleven years old were reading Nepos, the greater part of the hour was spent in a discussion suggested by the words, "columna rostrata." The central purpose seemed to be to inspire the boys with humane thoughts and high ideals. The study of the laws of language is necessarily made prominent in the elementary classes, but in the latter part of the course this gives way to the critical examination of the content of the literature.

The method of teaching history to classes of young pupils seemed to be a successful combination of the lecture and recitation. The lesson began with a quiz on the review, which was

conducted with great rapidity and animation. The questions covered a wide range and were evidently designed to fasten permanently in the memory a general outline of important historic data. The quiz was followed by a lecture on the topic of the next day's lesson, which occupied about half of the hour. The lecture was so vivid and skillful that one class which I saw was quite carried away by their interest in the teacher's narrative. There are obvious advantages in thus blazing the way through a period of history for a class of young students who are too immature in judgment to find a way for themselves. In a class of older pupils I saw a good illustration of the so-called seminary method of studying history.

Nothing excited my admiration more than the simple device by which the gymnasium undertakes to exercise an almost complete control over the literature that the boys read during the years of childhood and youth. Every class room that I visited contained a small portable closet, in which was kept a collection of interesting books, carefully selected and adapted to the age and maturity of the class. The supply is kept good by occasional contributions of the boys, and the books are given out with sufficient frequency to provide the boys with all the books that they have time to read out of school. A scheme so simple and salutary as this is worthy of general adoption.

The incentives that operate upon the minds of the pupils in the Prussian secondary schools likewise demand consideration. The graduates of the gymnasium not only escape a year's military service, but they are the only ones who are permitted to study law, medicine, or theology in the university. The right to compete for the honors and emoluments of the learned professions is, therefore, open only to those who succeed in the gymnasium. This special privilege must tend not only to bring the most ambitious boys into the gymnasium, but to incite them to the loftiest achievements in scholarship.

But what shall we say of the Prussian schoolmaster? In all essential respects, he is a professional man. He is trained for his duties with the utmost care and forethought, and, in turn, is required to carry on his work of instruction with an equal

degree of precision and skill. After graduating from the gymnasium and university, he must serve an apprenticeship of two years without pay under the supervision of some head-master before he can become a candidate for an appointment. These precautions insure the selection of only the most worthy candidates, and tend to produce a class of teachers who are mature in years and scholarship, and well informed as to the purposes and methods of instruction. Add to this, permanency of tenure and the certainty of a pension, and we have a combination of conditions that yields a class of men who have a capacity for skillful and efficient service that is unsurpassed by the teachers of any other country.

The chief reasons for the excellent results obtained in the Prussian gymnasium may be summarized in a single sentence. They are national institutions; they are believed to be essential to the national welfare; they easily maintain the strictest and most effective discipline; they have a broad, well-balanced, and substantial program of studies; the number of hours per week devoted to class exercises is exceedingly large; the purposes of the instruction are clearly defined; the methods of instruction are well considered, and wisely adapted to meet the ends designed; the incentives to study are extraordinary, and the teachers are well trained, mature, scholarly, secure in their positions, and sure of a pension when overtaken by ill-health or old age.

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THE LYCÉES OF FRANCE

I

THE lycées of France, including both the petits lycées and lycées proper, fill the places in the French educational system taken in our own by grammar schools, high and preparatory schools, and the two lower classes of the colleges. The petits lycées are sometimes housed in the buildings of the higher lycées, as in the Lycée Henri IV., sometimes in separated institutions, as where the Lycée Montaigne is petit lycée to the Lycée Louis le Grand. Their work is elementary, and falls only partially within the scope of this article.

The higher lycées, like our own secondary schools, aim at an education at once finishing and preparatory. At the end of his course the student in the lycée is ready to take the examinations for the baccalaureates in Lettres-Philosophie, Lettres-Mathematiques or Lettres-Sciences, or the examinations for admission to the higher schools—the École normale, École polytechnique, École centrale, École de Saint-Cyr or the École forestière. The lycées also prepare for the entrance examinations to the several departments of the public service, of which there are about forty divisions distributed among the various ministries; and thus there is brought to bear upon them an influence not felt by our secondary schools. How this influence may cause the student to overwork and to work for pass-marks rather than for power, how it baffles the efforts of councils set to reforming the curriculum, will be brought out at the proper time. Here in the beginning, however, something more intimate than the perfunctory introduction of classifying generalities must be given, lest what is to follow concerning courses of study and methods of teaching will be lacking in significance.

A personal acquaintance with the lycées of Paris can be secured only after one has received official permission to visit and "assist" at their classes from the Recteur de l'Academie de Paris, and thus one is made aware in the beginning of the highly centralized organization of the public schools of France,

which goes so far that the lycées of Paris are not only under the direct control of the university, but that they and all the lycèes in France and Algiers must follow courses of study decreed by the minister and council of education. But this fact implies neither politics in the schools nor a mechanical curriculum, as it might in this country; for, as between lycée and university, there is not only the enforcement of university ideas and the inspiration of university ideals, but a direct personal connection in that the university professor is often a professor in the lycée. Thus, among the French teachers that it has been my good fortune to meet, M. Victor Morel is professor of English in both the Sorbonne and the Lycée Louis le Grand, and as for the department of education, it contains such men as M. E. Lebon, fellow in the university, and professor of mathematics in the Lycèe Charlemagne. This constant personal intercourse between the lower and the higher schools, and between the schools and their governing board, ought to produce better results than our occasional schoolmen's conferences and the monthly meetings of boards of laymen whom the principal, superintendent, or president is too often obliged to approach as if he were the special pleading attorney of a pedagogical junta. And I believe that a study of the French schools will show that secondary school and university are working sympathetically and intelligently together, and that the curriculum and manual of discipline for the lycées are the work of experts laboring without interference from the outside.

Besides these more academical influences, there are others which one expects beforehand to find modifying the schools among the other institutions of the French, as the ideas of 1789, the Frenchman's love of clearness, harmony, and proportion in things, sundry inheritances from the schools of the Jesuits, together with the modifications of reformers—in the discipline of the schools many reflections of the French social system. But as a preliminary to all deduction, we must have first the curriculum itself; and its two divisions, the courses of study known as the modern and the classical, are exhibited below in tables that show the several studies, the number of recitation hours a week in each, the total hours of recitation, weekly, for each student, and the percentage of the total time devoted to each study:

MODERN

Studies	Division de grammaire			Division superieure				Per cent. of total time	
	6th class	5th class	4th class	3d class	2d class	1st class (letters)	1st class (sciences)	Letters	Sciences
French	6	6	5	4	5	3		21	19
German	6	8	4*	3	3	1 §	1 §	25	24
English, Italian, etc.			4	3	3	1 §	1 §		
History	1½	2	2	2	2	3	3	10½	9
History of Civilization and Art						2			
Geography	1½	1	1	1	1	1	1	5	5
Arithmetic	2	2	3	4				11	16
Geometry					4‡		6 ‖		
Algebra									
Trigonometry									
Descriptive Geometry									
Zoölogy	1								
Natural History						2	2	3	3
Geology		1		†					
Botany									
Physics				3	4		4	5	8
Chemistry						8	2		
Philosophy						1½	1½	8	3
Elem. Law and Political Enonomy									
Ethics			1			†	†		
Hygiene						1 §	1		
Bookkeeping									
Writing	1							11½	13
Drawing	3	3	3	3	3	1½ §	3		
Total	22	23	23	23	25	25	25½		

*The student must take two languages besides French. One, either English or German, is obligatory—the other, elective, is German. English, Italian, Spanish, Russian, or Arabic. †Twelve conferences of one hour. ‡Including ten lessons in cosmography. §Elective, one hour a week—literature included, in the study of the languages. ‖Including cosmography and mechanics.

CLASSICAL COURSE

Studies	Division de grammaire			Division superieure				Per cent. of total time
	6th class	5th class	4th class	3d class	2d class	1st class (rhetoric)	1st class (philosophy)	
French	3	3	2	2	3	4		11½
Modern Languages—English, German, etc.	3	3	2	2	2	3	1 ‖	10½
Latin	10	9	5	5	9	4		25
Greek	—	1	6	5		4		14
History	* 2	2	2	2	2	2	3	9
Geography			1	1	1	1½		4
Arithmetic	1	1						3
Geometry			2	3	3	2 §	2	4
Algebra								3
Zoölogy	1							
Natural History							2	3
Geology		† 1			‡			
Botany								
Physics							5	4
Chemistry								
Philosophy							8½	6
Hygiene							‡	
Writing								
Drawing	1½	1½	1½	1½	2 ‖	2 ‖	2 ‖	4
Total hours per week	21½	21½	21½	21½	22	22½	23½	.....

* One class.

† Geology, one hour a week, first semester; botany the second.

‡ Twelve conferences of one hour each in this year.

‖ Elective.

§ An additional conference of one hour a week is elective, and ten lessons in cosmography are included in the year's work in mathematics.

One need not study these tables long to see that they exhibit as in actual practice, rational ideas that have long been urged by our best teachers as necessary reforms in American schools, until at last they are being reduced to working principles among us. It will be observed, first, that the boy's school life is treated as a consistent whole, that there is nowhere such a disastrous break as occurs between our grammar school and secondary school, and in lesser degree between secondary school and college. From the sixth class to the classes in letters, philosophy, and science, from the eighth to the eighteenth year, there is, in the lycée, orderly development—indeed it begins in the very first or "preparatory" class of the elementary division. In this class, for example, the student commences with oral exercises in English and German, and with simple biographical stories from history, and these subjects, modern language and history, are not interrupted for a single week until they are concluded, six or seven years later in studies in the English and German literatures, and the political and economic history of France. Moreover this continuous development of subject-matter is not mere official organization, it is guaranteed and made vital by the personal relations, spoken of above, existing between petit and higher lycée, and between lycée and university.

This treatment of each subject as a larger method whole has the added advantage of affording opportunity for really scientific ordering and correlation of studies. As a foundation to all education, a familiar acquaintance with one's mother tongue and literature, and with one or two modern languages, is considered essential, and accordingly we find that students in the classical course spend 22, and students in the modern course 45 per cent. of their time in acquiring French, and English or German, or both, together with, sometimes, Russian or Italian or Spanish. Therefore it is not surprising that the style of the French newspaper article does not usually offend, that French boys who speak either English or German are not rarities, and that the young Frenchman who wishes to travel has some equipment for his pleasure and his work.

In the French schools language means literature as well as

several other things. It means literature when it is made helper to history, geography, and the classics—as it is in the lycées in a manner that will be discussed later. For the present it is enough to show that language, drawing, and mathematics, music, and gymnastic, or, to put it abstractly, thought, form, emotion, and will, are made the piers of the bridge from knowledge to power.

The student in the classical course must spend 4 per cent. of his time in drawing, and may thus spend 8 per cent. of it if he so elects. Students of the modern course spend about 12 per cent. of their time in drawing. Music is obligatory through the fourth class. It consumes one or two hours a week, and is supposed to fit the student to read music readily, and to sing a part in a song of moderate difficulty. The study of the elements of harmony is elective for students of the upper classes. Three hours in the week are reserved for gymnastics and simple military exercises. Whether the student gets enough of music or not I cannot say. I know that he does not receive adequate physical training, and I do not know that he is given any manual training. Failure to develop physical bottom is the weak point in the educational bridge.

In mathematics the student is found finishing arithmetic in the sixth and fifth grammar classes. In the fourth class he begins geometry—as he should—before he begins algebra. He makes acquaintance with algebra in the third class, together with, in the modern course, physics and chemistry, and both mathematics and physics and chemistry are finished by the division in letters in the second class, that its students may devote their last year to literature, history, and philosophy; while the division in science is continued in mathematics and physics and chemistry throughout this last year. Thus it will be seen that the more difficult studies of physics and chemistry are not begun before the student has some maturity and some foundation for them in geometry and algebra. In the upper classes of the modern course the physics and the chemistry are carried along with trigonometry and descriptive geometry. The "natural history" required in the last year of both courses

includes animal and vegetable physiology, hygiene, and a brief exposition of the elements of palæontology. The course in philosophy embraces psychology, logic, morals, and the elements of metaphysics. It is supplemented, in the modern course, by lectures on the principles of law and political economy.

Up to this point nothing has been said about Greek and Latin, because I wish to conclude this brief survey of the studies and their ordering by an analysis of the courses in the classical languages, history, and geography, to show in more specific detail how the subjects are developed and correlated. I need scarcely say that before the student has been introduced, in his eleventh year, to Latin and ancient history, he has already acquired some ancient and a great deal of French history out of the biographies of illustrious men and by learning to tell the stories of celebrated historical scenes; while in geography he knows his own town and department, and has general notions of France and the five continents. Moreover, he has learned some grammar, not as a study by itself, but naturally while learning to read and write his own language, and while struggling with the difficulties of a foreign language, either English or German. Now that he begins Latin he has the grammars of three languages, two of them closely akin, for purposes of comparison, and in the year following, when he begins Greek, he has four; his knowledge of history is being constantly enriched by readings in three literatures, while at the same time it is not forgotten that he is a French boy in whom his native literature must be developing a sense of nationality. If, in the period of secondary training now properly beginning, he seems to be making extraordinary progress, it must be borne in mind that there are other factors than a scientifically arranged program of studies at work—in language the constant social and commercial intercourse among neighboring countries and the descent of French from the Latin; in history the occupation of ground at once the theater and the museum of the centuries; and in all the studies temporary advantage of an early maturity.

To return to the program, Latin begins in the sixth class with the parts of speech, phrase translations from and into the

vernacular, and with readings in the texts *Epitome Historiae Graecae* and *De Viris Illustribus Urbis Romae*. In geography the classic region of the Mediterranean circle of lands is especially studied, also the geometry of the globe, the structure and form of the continents, the principal states, their productions, capitals, etc. In history the geography of the oriental empires, their history, and the oriental beginnings of Greek history are developed.

The program for the Latin of the fifth class is as follows: Review work; elementary syntax; sight translations of French to Latin and a comparison of construction in the two languages; sight and prepared translations of the texts *De Viris, Selectae e Profanis Scriptoribus Historiae*, from Nepos and the fables of Phaedrus, etc., and scansion. Especial stress is laid upon the exercises in the texts. Greek is begun in this class. Two hours a day are devoted to elementary work, as in the program for the beginners' Latin class; and the history and geography of Greece are finished. In this year geography is made the vehicle of nationality, the frontiers, the loss of territory in 1871, and the colonial possessions of France being especially emphasized; and this work, and also the work in history, is supplemented by readings from Corneille, Molière, Racine, La Fontaine, and Fénelon.

The Latin program of the fourth class is in general like that of the fifth, and, as in the latter, written and oral themes and the biographies of the authors read, are included in the work. It is in the fourth class that the student is encouraged to do private outside reading in the authors of the previous year's study. The texts read by the fourth class are Nepos, Caesar's *De Bello Gallico*, Cicero's *De Senectute*, the *Aeneid* of Virgil, and the *Metamorphoses* of Ovid. It will at once be seen how admirably these authors link the Latin to the Roman history of the year; and the Greek authors read, Aesop, Xenophon, Lucian, and Aelian shed light upon the history of the previous year. This reinforcement of studies is better than anything that I know of in our own public schools. I have before me the programs of two high schools of the better class in the middle West, and in one of them but one year of general history is given in the classical course, and that is associated with the third year of Latin and

the second year of Greek—while in the other all the history of the classical course comes in the first three semesters.

Only one of the two courses referred to above contains geography, offering two and one half hours a week of it during the first year. This subject—one that can be made so much *en rapport* with life from the boy's point of view—has been as admirably developed in the French schools as it has been deplorably neglected in our own. I wish that I had space to give a complete outline of the geography taught in the lycées, so much does it impress me as a fine adaptation of instruction to the needs and prepossessions of boyhood. Yet it will be well to consider briefly the opportunities that the professor of geography is given in a well-arranged curriculum, as illustrated, for example, in the bold outline of the geography of the third class in the classical course of the lycée. The student is now fourteen years of age. In French he is reading Michelet's *History of the Middle Ages;* in Latin, *Livy*, *Sallust* and *Virgil;* in Greek, *Herodotus* and the *Odyssey;* in German, *Maria Stuart*, or in English, Lamb's *Tales from Shakespeare*. In history he is studying the Roman Empire in the East, the Norman invasions, the Mohammedan Empire, and the Crusades. He has "traveled in the realms of gold, and many goodly states and kingdoms seen," until his interest and imagination have been stirred by vivid pictures from literature and history—pictures of a period when geography was a romance of exploration and adventure. With boys fast in such seizure, it will not be very difficult for the teacher to make the "Africa, Asia, Oceanica" of the course in geography, "their configuration and superficies, seas and coasts, archipelagoes and islands" realms of gold. He may even "hold in fealty to Apollo" their "grand features of relief—rivers and lakes—climates—regions uncultivated—fauna—the principal possessions of European states—chief productions—population—indigenous races and immigrations—language and religion." And with "great historic remains—great voyages of discovery—commerce—the principal ports—chief routes of commerce by sea and land—great lines of telegraph," he may startle the boy to the "wild surmise" that the study of geography may, after all,

throw valuable side lights upon the travels of Polo or the whereabouts of Treasure Island. At any rate, such possibilities of inspired teaching as the outline just quoted indicates must appeal to all of us—and to the mature, widely-read, trained, and enthusiastic professor of history and geography, there is suggested an opportunity almost equal to that given to the Russian professor of literature so sympathetically described in Prince Krapotkins' autobiography, of whom the prince says:

> In Russia there is not a man or woman of mark, in literature or in political life who does not owe the first impulse toward a higher development to his or her teacher of literature. Every school in the world ought to have such a teacher. Each teacher in a school has his own subject, and there is no link between the different subjects. Only the teacher of literature, guided by the general outlines of the program, but left free to treat it as he likes, can bind together the separate historical and humanitarian sciences that are taught in a school, unify them by a broad philosophical and humane conception, and awaken higher ideas and inspirations in the brains and hearts of the young people. . . . . The same thing ought to be done for the natural sciences as well. . . . . Perhaps the teacher of geography might provisionally assume this function; but then we should require a different set of teachers of this subject, and a different set of professors of geography in the universities would be needed. What is now taught under this name is anything you like, but it is not geography.

This criticism by Prince Krapotkin of European schools in general still holds true of the French lycées in some particulars; nevertheless the lycées attempt and in a measure realize his ideal, partly through the correlation of studies described above, and partly through such generalizing courses in geology, cosmography, literature, and the history of civilization and art as will be mentioned farther on. Surely the French boy who, by the time he has completed his third class, has not begun to acquire a self-directing interest in his work must be dull indeed, and quite unprepared to do the work of the second class, in which, according to our arbitrary marking off of educational periods, he finishes his secondary schooling. For although he is given but slight opportunity to elect his studies, he will nevertheless fail to follow out the historical method largely pursued in this class, unless he begins to think and compare for himself—and

he must do this, to a degree, in spite of the handicap he is subjected to in an overload of work.

To make this clear, let us take the study of Greek. Heretofore very little has been said about the Greek, because the amount of work, and the method prescribed in it are essentially the same for the Latin. The Greek of the second class includes the usual review of grammar, the theme and the formal translation, and a choice of readings in Xenophon, Plato, Plutarch, the *Iliad*, and Euripides, also certain *pages et pensées morales extraites des auteurs grecs*. But in addition to all this, the student must prepare ten lessons in the history of Greek literature, beginning with the early poetic traditions and ending with Christian oratory in the fourth century. It is this work, with similar courses in the history of French and of Latin literature, together with the work in history, geography, geology, and cosmography, that inaugurates that period of youth when the charms of general ideas and of generous philosophizing first begins to be felt. And the teaching of this period is certainly informed with the spirit invoked by Prince Krapotkin; for, to take only one instance, in the lectures given in geology at this time the bold enumeration of strata and fossils is rigorously proscribed — the subject is treated as earth history, that the student may carry forward to the advanced work of the classes in rhetoric and philosophy the idea of development by evolution. As the work of the classes last mentioned goes beyond what is attempted in our secondary schools, I will not outline it farther than has already been done in the preliminary survey of the curriculum. Nor shall I have space here to give details from the courses in science. It will be seen, however, by consulting the percentages given in the tables above, that science is by no means neglected even in the literary courses of the lycées. These tables also show how much recitation time is actually devoted to any one study.

EDWARD L. HARDY

LOS ANGELES, CAL.

(To be concluded)

BOOK REVIEWS

Essentials of Psychology. By COLIN S. BUELL. Ginn & Co., 1898. Pp. viii + 238.

THERE have been many attempts in the past few years to satisfy what the author of this neat little volume calls "a growing demand for a psychology suited exactly to the needs of the normal and high schools" which have failed of their mission. While Principal Buell's book has some very commendable features it has two errors common to books of this class: it begins with an unnecessary discussion of the difference between the "New Psychology" and the "Old Psychology," and it devotes a disproportionate amount of space—six of its twelve chapters—to a physiological treatment of the senses. In the psychology proper is found a simple adaptation of some of the best results of the labors of specialists in this field. The concrete examples are well chosen, and the suggestive questions scattered through the book add much to its value as a text-book. In the hands of a teacher who knows how to draw the lines of demarcation between psychology and the neighboring sciences this will prove a good tool.

W. A. CLARK

THE UNIVERSITY OF CHICAGO

Survey of American History. By H. W. CALDWELL.

DURING recent years there has been an increasing desire among students of history to use extracts from original sources instead of secondary material. This desire has led to the publication of several series of "Leaflets," following the general style of the Old South Leaflets, so that many interesting papers have been placed in the reach of those unfortunate ones who have not had access to large libraries. The little volume entitled *A Survey of American History* contains ten papers which were issued during the college year 1897–8 by H. W. Caldwell, of the University of Nebraska. In addition to a suggestive introduction there are well-selected extracts from writings of each period of American history from early colonial times to the present. A small price is asked for the collection, so that it should find its way

to the table of many teachers in the public schools and academies of the country. There is just a suspicion that the thought of cheapness in price may have led to the use of a poorer quality of paper than is desirable in a production of permanent value, but subsequent editions may be looked for to remedy what seems the greatest defect in the book.

FRANCIS W. SHEPARDSON

THE UNIVERSITY OF CHICAGO

The Elements of Physics. For use in high schools. By HENRY CREW, Ph.D. The Macmillan Company.

THIS book is so very unlike the ordinary high-school text-book in physics that it demands the careful consideration of everyone interested in the subject. As an elementary text-book, it possesses the merit of being strictly what its title indicates. That is, it deals with fundamental principles only.

The author emphasizes the fact that "physics should be taught in the same manner to the boy who is preparing for college and the boy who is not," and he accordingly begins at once to prepare the boy for college physics. As might be expected under such circumstances, the book contains rather an unusual amount of symbolic language and a somewhat large number of technical terms. The discussion of scalar and vector quantities is certainly an innovation in high-school physics, and it is probable that the rule for vectors on page 7, presented without a demonstration, will strike the average high-school student as a surprise. Such discussions as the one on the distinction between *angular speed* and *angular velocity* and the representation of angular velocity by a straight line are wholesome, but there may be some doubt as to whether or not the high school will take kindly to them. On the whole, there may be some doubt about the book fitting easily into its place in the high school; but the fault is as much with the school as with the book.

Dr. Crew is not a mere text-book maker, but a thorough physicist and a most successful teacher. In the present work, the arrangement of the subject-matter is admirable, the style is most pleasing, and the entire work is characterized by mathematical accuracy and clearness. The constancy with which the author requires the student to *think*, may almost be said to place the book in a class by itself. The introduction of a group of carefully selected problems at the end of each

discussion is a feature of great merit. Some of the answers are incorrect, but that is an insignificant matter in the first edition of a work of this kind.

As an introduction to theoretical physics, or as a college preparatory text-book, this work is superior to anything else in print; and it enjoys the unique distinction of being the first of its kind in the high-school field. There ought to be a great demand for such a book, if high-school teachers and students can be led to recognize its real value.

A. C. LONGDEN

THE UNIVERSITY OF CHICAGO

Lessing's Minna von Barnhelm oder Das Soldatenglück, with introduction and notes by STARR WILLARD CUTTING, Ph.D., Associate Professor of German Literature in the University of Chicago. New York: The Macmillan Company, and London: Macmillan & Co., Ltd., 1899.

SIMPLE style, careful delineation of human life, subtle charm, genial humor, national character, patriotism, these are the qualities that made *Lessing's Minna von Barnhelm* the first great German comedy. The constantly increasing number of annotated editions attests its unique position in German literature and its undying popularity. Of the editions prepared for English-speaking students, Professor Cutting's has the best and most complete equipment. His introduction is divided into three parts. The first makes brief mention of the political and literary condition of Germany before the eighteenth century, and explains Gottsched's service to German literature; the second, based largely upon the *Hamburgische Dramaturgie*, discusses Lessing as dramatist and dramatic critic; the third treats of the genesis, time and place of action, plot, characters, structure, and language of *Minna von Barnhelm*. The introduction ought to contain, also, a chapter on the historical background. The text is supplied with notes, bibliography, and index. For school purposes a vocabulary would also seem essential. With due acknowledgment free use has properly been made of the extensive *Minna* material. The notes are good; one has the feeling that they have been prepared by a teacher who is acquainted with the real needs of the student. The book will certainly inspire students with a desire to know more about Lessing.

CHARLES BUNDY WILSON

THE UNIVERSITY OF IOWA,
Iowa City

Method in Education. By RURIC N. ROARK. American Book Co.

OF the many books for teachers that have recently come from the press, *Roark's Method in Education* seems to be one of the best.

In recognition of the fact that too many teachers have had little or no professional training, the author deals with the practical side of their work in a definite and sufficiently detailed way, at the same time recognizing the psychological principles which are the basis of all correct teaching. He sets forth as the foundation of method what he believes to be well established facts of growth, based upon "a sympathetic study of normal childhood," explains briefly the meaning of each, and follows with a discussion of the general principles of method. The lesson, under three heads — assignment, preparation, and recitation — is considered at length, and in a way that must prove helpful to all teachers and invaluable to those who have not realized its importance. The value of drills and reviews is justly emphasized and the purpose of each clearly defined. School studies are discussed as to their relative values, and each is treated in detail as to subject matter, method, and results.

Mr. Roark's book is plain, direct, and usable, a genuine teacher's aid.

L. D. ELLIS

THE UNIVERSITY OF CHICAGO

COMMUNICATIONS

A WORD OF COMMENT

Editor of the School Review.

KINDLY allow me a word of comment upon a criticism of Langlois and Seignobos' *Introduction to the Study of History* that appeared in your September number. Under ordinary circumstances I should not feel called upon to make these comments, but I am influenced by the belief that the criticism, if unanswered, might prejudice some of your readers against the book and thus prevent them from using it.

The gist of the criticism is that the attitude of Langlois and Seignobos "toward their predecessors (writers on method) is never generous, sometimes not even just;" that in their book "history is conceived and treated exclusively in the objective sense, as a series of events with a causal nexus," and that "notwithstanding the author's severity toward the ignorance of foreign tongues, still common among French scholars, their own command of foreign literature is not all that might be desired."

Unfairness, ignorance, and lack of scholarship are, indeed, "curious limitations" for men of international reputation like MM. Langlois and Seignobos. A heavy burden of proof rested on the reviewer.

To say that they condemn Freeman and dismiss Droysen's *Grundriss* "as heavy, pedantic, and confused beyond imagination," is not necessarily to convict them of unfairness. These things may be *true*, and while I have always had the kindliest feeling toward Freeman and Droysen, I believe that Langlois and Seignobos made no incorrect estimate of the value of their treatises on method. Others may not think so. It is a matter of judgment, not of generosity. As to the assertion that Freeman was "condemned mainly, it would appear, on the authority of a flippant review," it might be well to note that it is not the practice of scholars to condemn a book in that way. The reviewer might have found evidence on page 46 that Langlois had a copy of Freeman's *Methods* before him.

The reviewer's statement that Bernheim "often receives less than simple justice" is not supported by the text (page 10), nor does it agree with the impression made by the book upon Professor Powell,

who speaks, in his introduction, of Bernheim's *Lehrbuch*, "so justly praised and used by our authors."

Chapter IV of Book III is a sufficient answer to the criticism that history is never treated by the authors "as a series of events with a causal nexus."

The last criticism, that of ignorance of foreign literature, is so manifestly unsupported by anything found in the book itself that it occurred to me that possibly the reviewer possessed some outside information.

If the authors have not acquainted themselves with what has been written in English, German, Italian, and Spanish on method, it is not through ignorance of the languages. Of the list of books that they are criticised for barely mentioning, or not even naming, but one is found in Bernheim's *Autorenverzeichnis*. Shall we charge Bernheim with ignorance? Certainly not. Works like those of Altamira, Hall, and Hinsdale have no place in a *Lehrbuch der historischen Methode* nor in an *Introduction aux études historiques*. Possibly Seignobos is as well acquainted with the contents of *La Enseñanza de la Historia* as anybody after the author himself. He refers to it in the proper place, namely, in the Appendix dealing with the *teaching* of history in the French secondary schools.

This book, by Langlois and Seignobos, was the outcome of a series of lectures delivered at the Sorbonne to young university students. "It is a sketch in outline," and "not a treatise on historical mythology, like *Lehrbuch der historischen Methode*." The authors had no call to tell all they knew, nor to quote all the books and essays in German, English, Italian, and Spanish dealing with methods of studying and teaching history. They were writing for a French audience and a popular audience.

These are the comments that I felt called upon to make that the work of these two distinguished Frenchmen might be taken at its true value by the readers of the REVIEW. To those acquainted with the men and their work, no comment is necessary.

FRED MORROW FLING

THE UNIVERSITY OF NEBRASKA
September 12, 1899

NOTES

THE office of the *Chautauquan* has been removed from Meadville, Pa., to Cleveland, O.

THE annual meeting of the Association of Colleges and Preparatory Schools in the Middle States and Maryland will be held at the State Normal School, Trenton, N. J., on December 1 and 2.

THE September *Scribner's* contains a good school story, "A Copley Boy," by Charles Warren. The author was private secretary to Governor Russell. The story describes how a governor went back to his old fitting school and spent a day with the boys, with profit to the boys and more profit to the governor.

THE total number of active and associate members registered at the Los Angeles meeting of the National Educational Association was 11,544. This number will be increased by returns from about 1700 active members who were not present at this meeting, so that total membership of the N. E. A. for this year will doubtless amount to over 13,000. Another new high water mark!

THERE is a timely paper on "An Educational Policy for Our New Possessions," by William T. Harris, in the September *Educational Review*. Other articles in that number are: "Educational Situation in Chicago," by Joseph W. Errant; "Women in the Public Schools," by James C. Roykin; "English in Regents' Schools," by Arthur L. Goodrich; "The Teaching of German in Germany," by Christian Ufer; and "Educational Progress of the Year," by Nicholas Murray Butler.

MR. WALTER H. PAGE has resigned the editorship of the *Atlantic Monthly* and has accepted an invitation to take a prominent post in the direction of the literary work of the allied houses of Harper & Brothers and the Doubleday & McClure Company. His successor in the editorship of the *Atlantic* is Mr. Bliss Perry, known in literature as the author of two novels and a number of essays and stories. Since his graduation from Williams College in 1881 Mr. Perry has been in the department of English, first at Williams and afterwards at Princeton University, where he was lately appointed to the Holmes professorship of English literature.

AN important step has been taken by the Chicago Board of Education in the establishment of a special department of child-study and pedagogical investigation. Mr. F. W. Smedley, of the University of Chicago, has been

called to the direction of this work. The establishment of the department is largely due to the efforts of Dr. W. S. Christopher, now a member of the Chicago Board of Education, who has long been favorably known for his interest in child-study investigations. The department will for the present in the main continue the work of the past year in making physical examinations and fatigue tests. The ultimate aim of the work is to establish a physical basis for pedagogical diagnosis.

THE fourth number of the fourth volume of the *Deutsche Zeitschrift für auslandisches Unterrichtswesen*, which has just appeared, contains articles upon "Physical Measurements of Children," by Arthur MacDonald, Washington, U. S. A.; "Commercial High Schools in Austria," "The Missionary Associations of the Public Schools in England," "Educational System of Scotland," "Common-School System in Luxemburg," "Private Initiative and Popular Education in Siberia," and, in the department labeled *Rundschau*, many interesting notes from all parts of the world. This magazine is indispensable to those who would keep informed on the progress of educational organization and administration the world over.

SECOND-HAND LIBRARIES.—The fact that a large number of the expensive books in free public libraries are purchased in the second-hand market is not generally known, and the knowledge of it will give little pleasure to the patrons of such institutions. That such is the case is revealed by a quotation from the report of the commissioners of a large library, which is printed in a recent issue of *Literature*. The writer in *Literature* very naturally condemns the practice from the point of view of the author and the publisher, who are both thus defrauded of a certain amount of just profit. He, however, admits that the practice is one which is likely to be brought to a sudden end if the public demands new books so soon as they are put on the market.

THERE never has been a time when the navy failed to interest the youth ot the land, but not since the times of the Civil War certainly has it been such a glowing topic of interest as since the memorable achievements of our battle ships during the last year. It is an exceedingly opportune time, therefore, for the publication of *Our Navy in Time of War*, by Franklin Matthews (D. Appleton & Co.). The author's special preparation for his work consists of many years of special attention to naval problems in connection with newspaper work, and a graphic and entertaining style peculiarly adapted to writing of this kind. The great achievements of the navy are recorded in a most interesting way, while the work is well provided with artistic illustrations and good clear maps. As a supplementary reader in schools or a gift book for boys it would be difficult to suggest a work more appropriate than this.

THE London *Educational Review* has undergone an entire change of form. With Volume I of the new series it is published substantially in the shape of the SCHOOL REVIEW, and appears every month instead of six times

a year as before. Its price has been reduced from 1 s. to 6 d. for each number. The leading articles for August 1899, are: State Organization of Secondary Schools, by Dorothea Beale, Principal of the Ladies' College, Cheltenham; Our Secondary Schools and their Relation to Our Imperial Needs, by Robert L. Morant, M.A.; Idealism in Education from a Practical Point of View, by John Russell, B. E., Assistant Master, University College School; The Comparative Accuracy of Men and Women, by Agnes Robertson; National Education in Sicily (II): One of our Girls' Schools, by Irene Vespri. In addition there are interesting editorial departments, exchange departments, book reviews, and general notes. The magazine is ably edited by Mr. W. K. Hill, and certainly deserves a large measure of success.

THE constant demand from schools and clubs for good reproductions of famous paintings at a reasonable price has led to the publications of the "Arts Study Pictures." These are published monthly, average 5×7 inches in size, are printed from the best half tone plates, and on paper considerable larger than the plates themselves. Each portfolio contains ten different pictures and the portfolios are issued semi-monthly. The price is 10 cents a number, or $2.40 a year. The pictures in the portfolio before us represent chiefly Julien Dupré, and are taken from rural life. The plates are finely executed and are not fastened together, but simply lie in the portfolio so that they may be taken out for school use. These pictures may be thoroughly recommended, for they are thoroughly good, while the price puts them within the reach of all. *Arts for America* published monthly by the same association is devoted in part to the explanation of the pictures contained in the portfolio. The address is "Central Arts Association, Fine Arts Building, Chicago."

THOSE who have read *Robinson Crusoe* — and who has not? have seldom stopped to concern themselves with the latitude and longitude of Crusoe's Island, but from time immemorial we have been told that the wonderful exploits of our boyhood hero took place upon the Island of Juan Fernandez, and that Robinson Crusoe was really Alexander Selkirk. Frederick A. Ober says, in his *Crusoe's Island; A Bird-hunter's Story* (D. Appleton & Co.), that he always discredited this tale, and was satisfied that Robinson Crusoe was not Alexander Selkirk, and that his island was really the Island of Tobago, off the mouth of the Orinoco River. When Mr. Ober got big enough he went to Tobago to prove the truth of his theory. That he was sent out by the Smithsonian Institution, and that his main object was to study birds is, of course, only an incident of the tale. There is plenty of natural history and any quantity of birds in the book, and there is a new man Friday and a story of sufficient interest in itself. Moreover, the appendix gives the whole argument in favor of Tobago as the true Crusoe's Island, with an interesting picture of Crusoe himself, and a facsimile of the orginal account of his adventures, written by himself and published in 1719. There are other interesting

matters in this appendix, among them the somewhat unnerving disclosure that Dr. Thomas Dover, to whose Dover's Powders so many sufferers have been indebted, was as notorious a pirate as physician, and sweat his patients in more senses than one.

IN the *Library Journal* for August 1899 Mr. Lucius Page Lane presents a rather novel suggestion to the effect that librarians shall make make monthly reports to the parents upon the reading of minors. The plan is clearly explained by the accompanying form:

BLANKVILLE PUBLIC LIBRARY

MARCH 5, 1902

Dear Sir or Madam: The books which have been borrowed during the month of February 1902 by Charles F. Rich, Jr., are as follows:

Author	Title	Class
King	*Under the Red Flag*	Fiction
Baldwin	*Horse Fair*	Fiction
Weyman	*King's Stratagem*	Fiction
Stoddard	*Red Patriot*	Fiction
Barnes	*Royal Traitor*	Fiction
Westall	*For Honor and Life*	Fiction
Stockton	*Adventures of Captain Horn*	Fiction
Munroe	*Painted Desert*	Fiction
Browne	*Robbery Under Arms*	Fiction
Duval	*Romance of the Sword*	Fiction
Seawell	*Virginia Cavalier*	Fiction
Lummis	*King of the Broncos*	Fiction
O'Donoghue	*Humour of Ireland*	Humor

It seems to the librarian that this course of reading is

precocious		inordinate
extraordinary		>excessive
valuable		generous
profitable	in kind	reasonable — in amount
>harmless		moderate
unprofitable		abstemious
injurious		parsimonious

Very respectfully,

PATIENCE WORKWELL, *Librarian*

To MR. CHAS. F. RICH,
73 Lawrence Street

Editorially the *Journal* says in the same number: "Theoretically the plan seems to fit in very well with much that is said regarding the library as an educational force; but, like many theories, it is unlikely to stand practical test. The ordinary librarian finds the wise choice of books and the process of supplying readers with the books they desire a sufficient tax upon time and energy; to add to these duties that of rendering judgment upon the use made by individual readers of the books thus supplied opens a prospect before which the boldest 'missionary librarian' may well shrink."

In the report of the Committee on College Entrance Requirements one of the most interesting features is the special report of the Committee of Seven of the American Historical Association. The report as prepared by the committee and presented to the Historical Association was much more elaborate than that which appears in the report of the National Educational Association. This fuller report, with a considerable number of appendices, has now been issued in a volume entitled *The Study of History in Schools*, by the Macmillan Company. The investigation of the subject has been most thorough, and has covered not only the United States, but also Germany, England, France, and Canada. The topics treated in the report are as follows: Preliminary Work of the Committee; Value of Historical Study; Continuity of Historical Study and the Relation of History to Other Subjects; Four Years' Course, Consisting of four Blocks or Periods; Why no Short Course in General History is Recommended; How the Different Blocks or Periods may be Treated; Methods of Instruction; Sources; Intensive Study; The Need of Trained Teachers; College Entrance Requirements. In the eight appendices these topics are treated: The Present Condition of History in American Secondary Schools; Choice of Subjects; Order of Subjects; Separate College Course; Time Given to History; Text-books; Collateral Reading; Written Work; Use of Sources; Teachers; College Requirements; Summary; Circular; Examples of Extended Courses; Study of History below the Secondary Schools; History in the German Gymnasia; History in French Lycées: History in English Secondary Schools; History in Canadian Secondary Schools; Some Books and Articles on the Teaching of History; Books with which every Teacher of History should be Acquainted; Other Noteworthy Books on Historical Methods; Ten Useful Articles on Methods of Teaching History in Secondary Schools; Valuable Works in Foreign Languages; Articles on the Teaching of History Written from the Point of View of English Schools; Maps and Atlases: Ancient History, Mediæval History, English History, American History, Index.

The report is one of the most valuable books on the teaching of history that has ever issued from the press. Thorough, comprehensive, practical, scholarly, the book cannot be spared from the working library of a teacher of history in a high school or academy, nor can it be spared from any good collection of pedagogical literature.

Platform of the National Educational Association Adopted at Los Angeles: — We reaffirm our belief that the course of education, despite difficulties, doubts, and discouragements, is steadily upward and onward. The year which has passed has been one of genuine progress. Sound educational ideals are more firmly established, the benefits of school and college education are more widely diffused, the work of teaching is more intelligent and successful, the teachers themselves constantly grow more earnest and more studious. The one dark page in the history of the year is that which

records interference with the work of public education and attacks, successful and unsuccessful, made upon it by political traders and spoil seekers. We appeal to the public and to the press to resist, to resent, and to punish these attacks, and we pledge our best efforts to the absolutely non-political and non-sectarian conduct of the work entrusted to us.

We record with gratitude our sense of obligation to those noble men and women who have held out a generous hand to education North, South, East, and West, and who, by their gifts and endowments, have added so much to the strengthening and upbuilding of the various types of educational institutions, general and special, elementary and higher, throughout the land. The influence of their example is widespread, and the effectiveness of their gifts is incalculable.

We emphasize once more the function of the school, as a community center, to draw to itself the children and the parents for gatherings which reflect the life of the people and which give it inspiration. Particularly in close association with the library, the school should make itself felt in shaping the thought of the people in ways and by methods which lie outside of the scope of formal instruction.

We support cordially every effort to elevate the profession of teaching by raising the standards for entrance to it, by promoting educational scholarship, and by providing for stability of tenure and for adequate compensation. We are prepared to accept the complementary principle, that inefficient and imcompetent teachers must yield to the professional judgment which asks their retirement from the school; and we deplore any and every attempt, organized or otherwise, to protect such teachers in their posts by influence, whether personal or political.

We wish by every legitimate means to aid the invaluable work of the Bureau of Education, and we ask that it be given such support by Congress as will enable it to perform, with fullest efficiency, the tasks entrusted to it. We recognize, perhaps more fully than do others, the value of the statistics of education collected in the census of 1890, and we earnestly urge upon the director of the forthcoming census the desirability of carrying on anew the lines of inquiry then pursued, together with such additions and improvements as experience has shown to be needed.

This association has long insisted and continues to insist upon the full recognition of all educational agencies as essentially undertakings in the public interest, whether they are supported by public taxation or by other means. All alike are and should be in heartiest coöperation, and any attempt to array one institution, or one form of educational effort against another, is little short of treason to the nation's highest interests.

The past year has brought new and grave responsibilities to our common country and has opened before it new and difficult opportunities. With a courage born of high hope and of confidence in democracy, the nation's

schools and schoolmasters will assume their full share of the burden so suddenly imposed upon our citizenship, and will contribute by every means in their power to the wise, patriotic, and democratic solution of the problems which confront us as a people.

THE BLAINE SCHOOL OF PEDAGOGY.—As a practical outcome of the deep interest which Mrs. Emmons Blaine has felt for a long time in the cause of popular education, she has now made provision for the founding and maintenance of a school which shall offer enlarged opportunity for professional training to all who are engaged in teaching, or who may desire to prepare for such work in any grade of school. Colonel Francis W. Parker, has accepted the presidency of the school, and thus has an opportunity, such as comes to few men, to round out a life-work of educational leadership.

The new school will be located opposite Lincoln Park, on the north side of Chicago. While buildings and material equipment will be as perfect as skill can devise and money purchase, the chief strength of the institution will lie in its faculty. It will be composed of educated, trained, expert teachers who will form of themselves a compact body organized for the purpose of studying, continually, the problems presented by modern education.

It is proposed that the institution shall meet the demand for trained and efficient teachers in all grades of schools, including the kindergarten and college. Under the one organization two schools will be maintained, the Professional School and the Academic School. The Professional School will be devoted to the professional training of teachers who are preparing to occupy positions in elementary, secondary, normal school or college work. Special courses, also, dealing with the treatment and education of young children will be established. All the departments will provide graduate courses, offering opportunities for higher study in particular lines. The Academic School established for the education of children through all grades, including kindergarten, primary, grammar, high school, and a junior college course of two years, will have two branches. One of these will be located with the Professional School, and the other will be established as a free school at some point in one of the crowded districts of the city. The teachers in the Professional School will supervise, direct, and assist in the instruction in their respective departments in the Academic School. The teachers of both schools will form one faculty, organized as a unit for the good of the whole.

The students of the Professional School will be selected with great care. Only those who have good health, physical vigor, and sufficient education and refinement as a basis for professional study will be admitted.

In the Academic School the kindergarten, primary, grammar, and secondary schools will open to all children. The junior college grade will be open only to those who pass regularly through the secondary school.

The sessions of the Professional School will be continuous. The year will be divided into four quarters—autumn, winter, spring, and summer.

The fourth quarter will be devoted to summer school work, and will be open to all teachers, and any others who may desire to attend.

The Professional School is founded to meet a very large and urgent demand that has not yet been met by any school of the kind in this country, if we except the Teachers' College, in New York City. This demand is for thoroughly educated and thoroughly trained teachers who are capable of doing work far above that ordinarily done — work that is genuinely artistic in a high degree. The faculty of the Professional School will select its students from the ranks of the well-educated, and give them a training which will eliminate prospective failures, and insure success by allowing no one to graduate who does not manifest every evidence of efficiency.

The Academic School will take children of four years of age and carry them through kindergarten, primary, grammar, high school, and two years of college life. This school, from its beginning to end, will be under one head, who will have the entire faculty for assistants, thus making, so far as possible, a complete unity of work. The main feature of the school, which will make it somewhat exceptional, is the fact that every teacher is to be an educational expert.

It is now proposed to open the Professional School July 1, 1900. The first term will be a summer school, open to all teachers and others who may wish to attend.

The conditions for admission to the professional training school are to be, first, vigorous, robust health; there will be a very careful physical examination of all candidates; second, the candidates must have the foundation of a good education; the lowest demand will be a four years' high-school course in an accredited school. Most of the students, however, should be college graduates. The exception to these rules is the selection of teachers who have taught two or three years, and who show decided ability.

A very important feature will be the training of young women who do not intend to teach, in the care and treatment of children. Another and shorter course will be given to mothers, in the education, care, and treatment of their little ones.

NEW PUBLICATIONS

EDUCATION, PSYCHOLOGY, PHILOSOPHY

An Outline of the History of Educational Theories in England. By H. T. Mark. B. A. (London), B.Sc. (Victoria). Size 7¼ x 5 in.; pp. xi + 139. Price $1.25. Syracuse, N. Y.: C. W. Bardeen.

Methods of Knowledge. An Essay in Epistemology. By Walter Smith, Ph.D., Professor of Philosophy in Lake Forest University. Size 8 x 5½ in.; pp. xxii + 340. Price $1.25. The Macmillan Company.

The History of the Alphabet. An account of the origin and development of letters. By Isaac Taylor, M.A., Litt. D., Hon. LL.D., Canon of York. In two volumes. Volume I, Semitic Alphabets. Volume II, Aryan Alphabets. New edition. Size 9 x 6 in. 400 pages each. Price, both volumes, $5. Imported by Charles Scribner's Sons.

Organic Education. A Manual for Teachers in Primary and Grammar Grades. By Harriet M. Scott, Principal of the Detroit Normal Training School. Assisted by Gertrude Buch, Ph.D., Instructor in English in Vassar College. Size 7¼ x 5¼ in.; pp. viii + 344. Price $1.25. Boston: D. C. Heath & Co.

ENGLISH LANGUAGE AND LITERATURE

The Literary Study of the Bible. An account of the leading forms of literature represented in the sacred writings. Intended for English readers. By Richard G. Moulton, M.A. (Cambridge), Ph.D. (Pennsylvania). Professor of Literature in English in the University of Chicago; late university extension lecturer (Cambridge and London). Revised and partly rewritten. Size 6 x 8 in.; pp. xvi + 570. Price $2. D. C. Heath & Co.

An Introduction to the Methods and Materials of Literary Criticism. The Bases in Esthetics and Poetics. By Charles Mills Gayley, A.B., Professor of the English Language and Literature in the University of California, and Fred Newton Scott, Ph.D., Junior Professor of Rhetoric in the University of Michigan. Size 7 x 5 in.; pp. xii + 587. Price $1.40. Ginn & Co.

A Course in Argumentative Writing. By Gertrude Buck, Ph.D., Instructor in English in Vassar College. Size 7½ x 5 in.; pp. viii + 206. Price 80 cents. Henry Holt & Co.

Graded Literature Readers. Edited by Harry Pratt Judson, LL.D., Dean of the Faculties of Arts, Literature, and Sciences, University of Chicago, and Ida C. Bender, Supervisor of Primary Grades in the Public Schools of Buffalo, N. Y. First Book. Size 7¼ x 5 in.; pp. 128. Price 25 cents. New York: Maynard, Merrill & Co.

Elements of Rhetoric and English Composition, First High School Course. By G. R. Carpenter, Professor of Rhetoric and English Composition in Columbia University. Size 7½ x 5 in.; pp. x + 254. Price 60 cents. The Macmillan Company.

New Century Readers. For Childhood Days. First Year. By John G. Thompson, Principal State Normal School, Fitchburg, Mass., and Thomas E. Thompson, Superintendent of Schools, Leominster, Mass. Size 7½ x 5½ in.; pp. 104. The Morse Company, Boston.

An Introduction to the Prose and Poetical Works of John Milton, Comprising all the Autobiographic Passages in his Works, the More Explicit Presentation of his Ideas of True Liberty, Comus, Lycidas and Samson Agonistes. With Notes and Forewords. By Hiram Corson, LL.D., Professor of English Literature in Cornell University. Size 7½ x 5½ in.; pp. xxxii + 303. Price $1.25. The Macmillan Company.

GREEK AND LATIN LANGUAGES AND LITERATURES

School Classics. Edited under the supervision of John Tetlow. Cæsar and Pompey in Greece. Selections from Cæsar's Civil War, Book III. By E. H. Atherton. Size 6 x 4½ in.; pp. v + 188. Price 50 cents. Ginn & Co.

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Longmans' Illustrated First Conversational French Reader. With Notes and full Vocabularies, by T. H. Bertenshaw, B.A., B. Mus., Assistant Master in the City of London School. Size 7¼ x 5 in.; pp. viii + 174. Longmans, Green & Co.

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Episodes from Sans Famille, by Hector Malot. Edited with notes and vocabulary by I. H. B. Speers, senior assistant master William Penn Charter School, Philadelphia. Size 6½ x 4½ in.; pp. 167. Price 40 cents. D. C. Heath & Co.

Longmans' First French Reading Book and Grammar. By John Bidgood, B.Sc. Head Master of the Gateshead Higher Grade School, and Thomas Harbottle, Teacher of French in the same school. New edition. Size 5 x 7 in.; pp. 95. Price 35 cents. Longmans, Green & Co.

Longmans' Illustrated Second French-Reading Book and Grammar. By John Bidgood, B.Sc., and J. Watson Campbell, late Teacher of French in the Edinburgh Ladies' College. New edition. Size 7 x 5 in.; pp. 152. Price 50 cents. Longmans, Green & Co.

Heath's Modern Language Series. Lehrbuch der Deutschen Sprache. A Practical Course in German for High School, Academy or College. By Arnold Werner-Spanhoofd, Director of German Instruction in the High Schools of Washington, D. C. Size 7½ 5 in.; pp. xi + 301. Price $1. Boston: D. C. Heath & Co.

HISTORY, POLITICS, ECONOMICS

Studies in European History. Greek and Roman Civilization. With an introduction to the Source Study method. By Fred Morrow Fling, Ph.D. The University of Nebraska, second edition. Size 7½ x 5¼ in.; pp. xxviii + 163. Lincoln, Nebraska: J. H. Miller.

Topical Studies in American History. By John G. Allen. Mew edition, revised. Size 7½ x 5 in.; pp. xxxvi + 93. Price 40 cents. The Macmillan Company.

SCIENCE

Laboratory Exercises with Outlines for the Study of Chemistry. To accompany any elementary text. By H. H. Nicholson, Professor of Chemistry in the University of Nebraska, and Samuel Avery, Professor of Chemistry in the University of Idaho. Size 7½ x 5 in.; pp. x + 134. Price 60 cents. Henry Holt & Co.

Appleton's Home Reading Books. Nature Study Readers. By John W. Troeger. III Harold's Quests. By John W. Troeger, A.M., B.S. Size 7 x 5 in.; pp. xiii + 202. D. Appleton & Co.

The History of the European Fauna. By R. F. Scharff, B.Sc., Ph.D., F.Z.S. With Illustrations. London: Walter Scott, LL.D. New York: Imported by Charles Scribner's Sons, 1899. Size 5¼ x 7½ in.; pp. vii + 364. Price $1.50.

MATHEMATICS

Solid Geometry. By G. A. Wentworth. Author of a Series of Text-books in Mathematics. Revised edition. Size 7½ x 5¼ in.; pp. xvi + 469. Price 85 cents. Ginn & Co.

ART

The Riverside Art Series. Raphael. A collection of fifteen pictures and a portrait of the painter, with introduction and interpretation. Edited by Estelle M. Hurll. Size 8 x 5½ in.; pp. xvii + 74. Houghton, Mifflin & Co.